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ABSTRACT

This booklet offers four two-page case studies of schools demonstrating exemplary facilities design. The institutions profiled are: Beverly Elementary School in Allen, Texas; Charles Young Elementary School in Washington, DC; Robert L. Mueller Charter Elementary School in Chula Vista, California; and Ridgeland High School in Northwest, Georgia. (EV)

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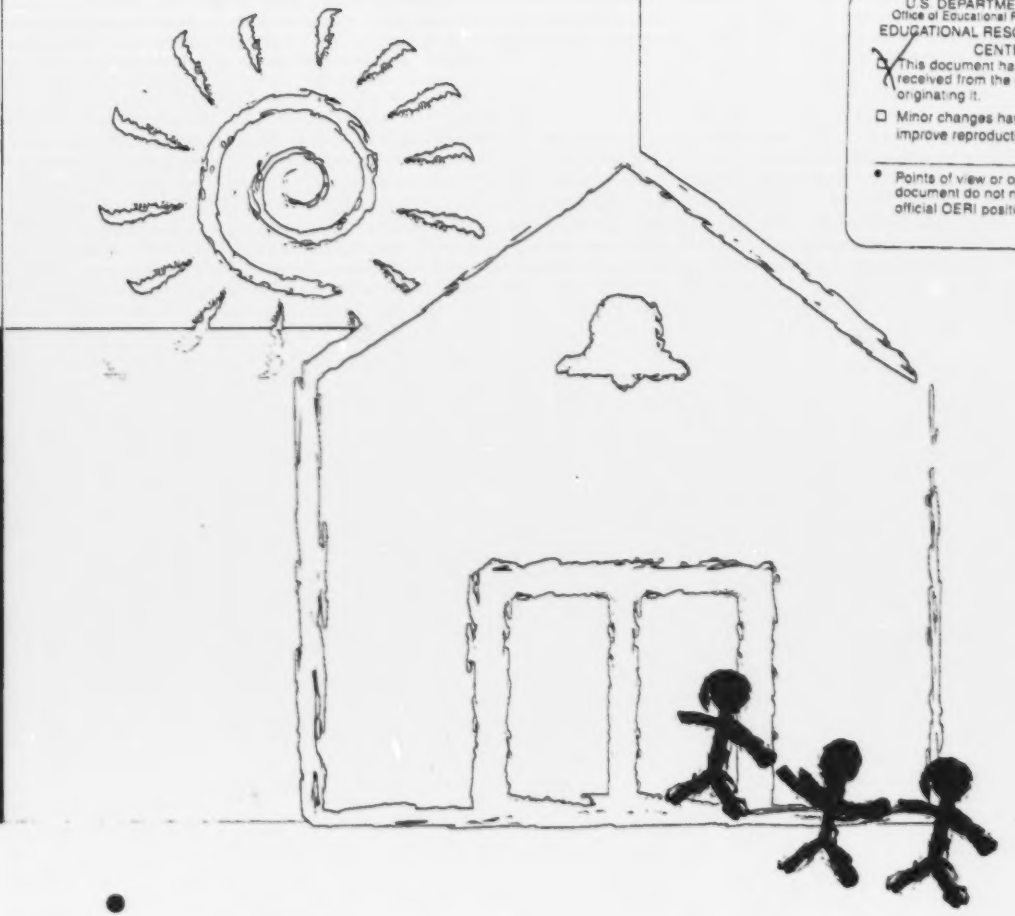
The Ideal Learning Environment

Case Studies of Design Solutions for Schools

the impact of classroom design



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Case Studies

Beverly Elementary School
Teachers and School Officials Design an Ideal Learning Environment

Charles Young Elementary School
School Officials Create 'Safe Haven' For Inner-City Students

Mueller Charter Elementary School
Renovation Brings Elementary School From Rags To Rich[illegible]

Ridgeland High School
Concerned Parent Brings Music to Students' Ears

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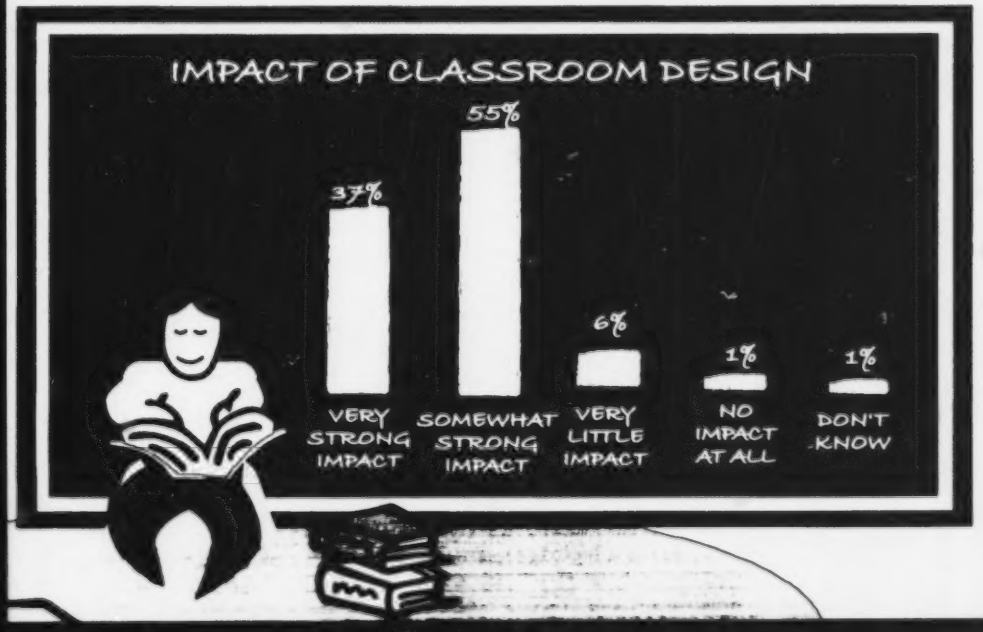
HOMEY CLASSROOMS = SMART STUDENTS



Percentage of teachers who say classroom design influences students learning

With better public school education on everyone's mind these days, the report cards are in for three elementary schools and the news is good – the grades are straight A's. And what has made these elementary school's success stories is the exceptional physical design.

By comparison, a recent Ideal Learning Environment Study found that only 18 percent of teachers nationwide would give their classroom designs an "A". The study, conducted by Beth Schapiro and Associates, a research firm based in Atlanta, suggests that 92 percent of teachers believe classroom design has a strong impact on students' learning and achievement.

For more information on the Ideal Learning Environment, visit www.carpet-schools.com. For general information visit the Carpet and Rug Institute (CRI)'s Web site at www.carpet-rug.com or call (800) 882-8846.

Beverly Elementary School

Teachers and School Officials Design an Ideal Learning Environment

Carpet enables teachers to work on the floor with students, expanding the learning space.

A hidden treasure in education lies within the heart of Allen, Texas at Beverly Elementary School. From a national standpoint, this elementary school's facilities design and academic programs are ahead of its time and surpass most elementary schools across the country. When constructed about three years ago, Beverly Elementary School's design was based on the input of teachers and school officials interested in creating an ideal learning environment for its students.

"A positive physical environment is important in the success of a school's students and saves the school district money," said Elizabeth Kirby, principal of Beverly Elementary School. "And 100 percent of our teachers would give Beverly's classrooms an 'A' for design."

Initially the Plano Independent School District commissioned the construction of Beverly Elementary School in 1997 to deal with the district's expansive population growth and to help relieve overcrowding at neighboring schools. While a design team, consisting of school administrators, architectural firm, the SHW group, construction firm, Candence McShane Corporation, site facilities manager, Robert Sands, and construction supervisor, Claud Fleener, began planning the 12-month construction process, school officials also turned to teachers in the district for their input.

Prior to Beverly's construction, Jayne Cantwell, the director of elementary curriculum, held a meeting with a committee of teachers from the district to discuss what design features needed to be improved and added to school facilities. The committee decided that the school should be built with products meeting stringent safety,

comfort, lighting and acoustics specifications. For example, the committee listed carpet as a preferred material because it helps prevent falls, provides comfort, absorbs noise and allows for flexibility in the classroom. School officials paid attention. Due to teacher participation, Beverly was designed and constructed to create a positive learning environment for its 763, K-5 students.

When Beverly Elementary School's doors opened in August 1998, a beautiful $6.5 million, 65,379 square foot building marked the successful culmination of the hard work and efforts of teachers and school officials. Teachers and students arrived at their new school to find an attractive, wide and open carpeted hallway lined with glass cases displaying vignettes of teacher's home lives. The soothing blue Mohawk carpet with teal and cream speckles, lined the hallways and classrooms and a state-of-the art media center and library graced the side of the school's entrance. Beverly's innovative design concept also included a spacious cafeteria, gymnasium and music room all sharing the same walls. Because of soundproofing and a motorized wall separating the gym and the cafeteria, these three rooms allowed for expanding the space to accommodate large school and community functions.

In order to create an ideal learning environment, the Plano Independent School District included specific design elements and features, such as an advanced security system, an air circulation system complete with central air and temperature controls in each room, adequate lighting (both natural and artificial), wide corridors, larger windows and glass classroom doors. In addition, each grade level was divided into separate corridors, each with a five-classroom pod, specifically designed to create open space.

The recent Ideal Learning Environment Study conducted by Beth Schapiro and Associates, a research firm based in Atlanta, indicates that a well-designed classroom improves learning and education. And with fewer than 18 percent of teachers giving their classrooms an "A," it is estimated that more than $500 billion will be spent renovating and constructing schools in the U.S. over the next 10 years.

"At Beverly we have comfortable, safe, attractive and well-designed classrooms that create positive learning environments for students which help promote learning and achievement," said Kirby – and she speaks from experience. Since it opened in 1998, the Texas Education Agency's annual report card has given Beverly Elementary School exemplary school accountability ratings two years in a row and acknowledgement for high performance in reading and mathematics. Beverly also was named as a Plano Independent School District Exemplary Writing School for both 1999 and 2000.

Beverly's 36 classrooms and other additional facilities include features that enable students to learn more efficiently and for faculty to teach more effectively. Computers with personal ear phones for individual learning and rollout media centers for music and video exist in all classrooms. Student lockers and abundant storage space line the classrooms and hallways. Large windows separate classrooms offering an open feeling with acoustical benefits. There is also a fully equipped teacher workroom and a separate parent/teacher conference room.

Beverly has also implemented a successful maintenance program to manage building facilities, control humidity and maintain good indoor air quality. For maintenance, they have a contracted team of custodians who clean the building daily. In addition, the Plano district facilities staff checks the building once a month for repairs and preventative maintenance. Since excess moisture and humidity are two of the nation's biggest maintenance and indoor air quality concerns, Beverly's HVAC air conditioning system keeps the relative humidity below 60 percent to avoid air quality problems.

Carpeted hallways and corridors offer noise-insulation when students pass between classes.

The community has embraced Beverly Elementary School as a haven for day care programs and after-school sports activities. Organizations, such as the Boys and Girls Club, use Beverly's facilities the entire year as an after-school day care center and the Boy Scouts host their monthly pack and scout leader meetings in the school's facilities. Sports organizations, such as the Plano Sports Authority, practice basketball and volleyball every evening in the gym. One added design feature that aids in protecting Beverly from potential trouble is a retractable gate that separates the gym and restrooms from the rest of the building. When the gate is down, all of this area is accessible and the rest of the school is protected from the public use.

While features at Beverly Elementary School can now be found at most of the Plano Independent School District's newer or renovated schools, they are very unique from a national standpoint. Beverly Elementary School has sent a message to educators around the country that good interior design leads to a positive learning environment.

Charles Young Elementary School

School Officials Create 'Safe Haven' For Inner-City Students

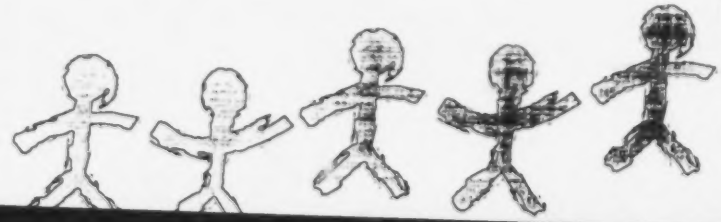
Carpet aids in student safety when working in the classroom.

Every morning, as Dr. Johnetta Smith rings the school bell on the steps of Charles Young Elementary School, she is greeted by smiles and laughter from her enthusiastic students. The children who attend the facility overlooking the Anacostia River in Washington, D.C. beam with pride and show reverence for their school with a passion most school children have never known. Before 1997, the school building was dilapidated because of deferred maintenance. With help from the Environmental Protection Agency Urban Schools Initiative demonstration project, the structure was transformed into an ideal learning environment where education thrives and enrollment, attendance and test scores have soared.

"Creating a positive physical environment at Charles Young has helped boost students' academic performance," said Principal Johnetta Smith, Ph.D. "Since the renovation, attendance has risen and students' standardized test scores have improved to meet superintendent-imposed targets. Students and teachers here are proud of their school and how it looks now," Smith adds.

Charles Young Elementary School, a handsome, traditional brick building, was built in 1931, and is named after the first African-American to graduate from West Point Academy. The school is located in northeast Washington D.C.'s inner-city and most of the students walk from the surrounding, lower-income communities. Nearly all of the students qualify for free or reduced-price lunches based on their family's income.

For years, the students and faculty of Charles Young had to contend with less-than-



ideal learning conditions. Many necessary repairs had been deferred. The roof leaked, the ceiling tiles had sustained tremendous water damage, the heat and air (HVAC) system did not function properly and mold and mildew grew freely on the walls, floors, and ceilings. Dripping steam pipes had formed a "lake" under the building. Interior temperatures in the classrooms often reached 104 degrees and the relative humidity was sometimes in excess of 95 percent. The carpet had been poorly installed and was wrinkled and deteriorated; the floors were damaged and poorly maintained. Rain seeped in through broken windows with frames rotten from water damage.

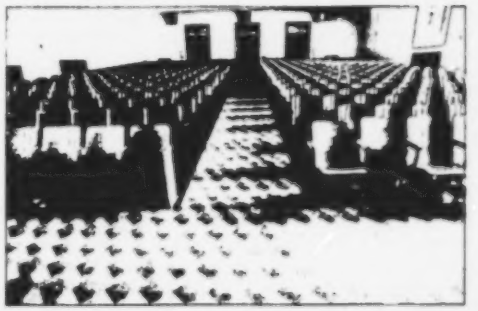
In 1997, through a $1 million grant made possible by the U.S. Environmental Protection Agency's Urban Schools Initiative, renovation and restoration began, turning the run-down school into a model learning environment. The EPA and the Washington, D.C., public school system shared most of the expenses.

When classes recessed for the summer, contractors and sub-contractors repaired the roof and plumbing, replaced ceiling tiles and began repainting the interior. Major construction, including new windows, brick repair, completion of painting, cleaning of floors and carpet replacement was put on hold until the following summer because of both timing and lack of funds.

When students returned in September for the 1998-1999 school year, they were greeted with a beautiful, safe, modern learning environment. Excess water sources from the roof, plumbing and HVAC system had been repaired and all water-damaged materials had been removed and replaced. The entire interior of the school was repainted and more than 230 large windows were replaced to provide protection from the outside elements, better ventilation and natural lighting. Portions of the roof were re-tarred and the brickwork of the exterior was repaired. The HVAC system also received a major overhaul.

In addition, more than 45,900 square feet (5,100 square yards) of appropriately specified, nylon carpet, donated by six major U.S. carpet manufacturers, was installed throughout the building. Installation was properly done using the industry standard, *Standard for Commercial Carpet Installation, CRI 104*. The old carpet, originally installed in 1975, was recycled. Equipment manufacturers donated vacuum cleaners, spot lifting equipment, extraction cleaning equipment and supplies. For the next year, cleaning services were also provided to help train the staff. Together with the carpet manufacturers, they also helped coordinate future maintenance with the custodial staff to outline proper vacuuming schedules, spot removal techniques and extraction-cleaning schedules. Additionally, several of the teachers requested vacuum cleaners to assist in the maintenance of their new space, because of the pride in the new carpet.

The HVAC system required a major overhaul to meet building codes and to improve ventilation in the building. New components and upgrades were installed with total electrical repairs, and a thorough cleaning. Now, temperature control is easier and the relative humidity is kept at a reasonable level of approximately sixty percent. In a report about this project, the EPA suggested that the total renovation costs to repair all damages attributable to poor maintenance of the HVAC system was $1.5 million. Annualized to account for the time value, this would be $38,391. Annual spending on in-house maintenance that would have been required in order to avoid the renovations would have been $364.



Large windows in the auditorium provide large amounts of natural lighting.

The renovated Charles Young School now contains many of the design elements cited by teachers in the Ideal Learning Environment Study as key components in creating an ideal learning environment. Classrooms offer comfortable seating and workspaces for students. Large windows provide adequate natural lighting. Wall surfaces are tackable, allowing teachers to exhibit student work, as well as display educational materials. Classrooms have a variety of various colors and patterns of aesthetically pleasing carpet, providing a quiet and comfortable learning space. This enables teachers and students to work in small groups or stretch out and read on the soft, warm surface.

In this area of Washington, D.C., where students have few comfortable and beautiful spaces in their lives, Charles Young Elementary School is a ray of light. It is a safe haven for the children of the community and a source of pride and honor for the students who learn there.

Mueller Charter Elementary School

Renovation Brings Elementary School From Rags To Riches

Carpet allows students to sit comfortably on the floor.

Many children read fairy tales, but the 870 students of Robert L. Mueller Charter Elementary School in Chula Vista, Calif., last year lived one. In this real-life Cinderella story, administrators and designers worked magic to transform this self-described "dirt bag" school into a state-of-the-art learning center that would bridge the gap between the economic status and education.

Situated less than 100 feet from California Highway 5 and the California Department of Transportation trolley line, Mueller Charter Elementary found its home in a 50-year old building that lacked modern educational amenities. Not only did it have to contend with heavy debris flying in from nearby roads, the school had no sound barrier to quiet the bustling traffic, no climate control to counter the hot, coastal air, no carpet to soften the classrooms and provide comfort for children and teachers, and no grass to run on in the playground. They were just the sub-par accommodations to which the multi-cultural, low-income student body had become accustomed throughout their lives. But that all changed in 1998, when the state awarded the school with a $5.2 million renovation grant.

A design team consisting of school administrators, design architect firm Ruhnau Associates, construction firm Barnhardt, school facilities manager David Dow and school purchasing director-turned amateur designer Debbie Alan immediately began planning a complete overhaul. They realized that students and teachers spend most of their time in school, so the interior design was important for making their school experience a positive one. And since most of the kids live in two-bedroom apartments shared with several other families, it was important that the new school be a spacious and comforting home away from home.

It was decided that the facility's underlying structure would remain, but the inside

would be gutted and rebuilt with products meeting stringent safety, comfort, lighting and acoustics specifications. Walls would be reconfigured so that each of the 40 classrooms had at least 900 square feet of space, and the interior design would be completely upgraded to improve student performance. Theirs were not ordinary students, and on their behalf, the team was committed to building an extraordinary school.

As planning took place throughout the 1998-1999 school year, the greatest challenge loomed nearer - timing. Contractors and designers would have to operate like clockwork to complete the project during the 77-day summer vacation. "The hour the teachers cleared their final boxes out, contractors began working 24 hours a day," said Mueller Charter Elementary School vice principal Greg Valero, who was integrally involved throughout the process. "As a deterrent, we instituted a $10,000 per-day fine if anyone ran behind schedule, but they didn't need it. They got their work done and we actually opened early."

Upon entering their new school in the fall of 1999, students and teachers were overwhelmed with pride. To say Mueller Charter Elementary was a new-and-improved school was an understatement. All the doors and light and fixtures were replaced, old tile floors were replaced with carpet, the cafeteria was transformed into a multi-purpose performing arts center, sod was laid outside, and an HVAC system was installed complete with temperature controls for each room.
Students also were welcomed by the school's new technology system, which rivals system databases in the nation's major corporations, with a minimum of four computers and one 52-inch television in each classroom. Traditional chalkboards and erasers were noticeably absent, with teachers instead using dry-erase whiteboards and computer-based presentations to teach daily lessons.

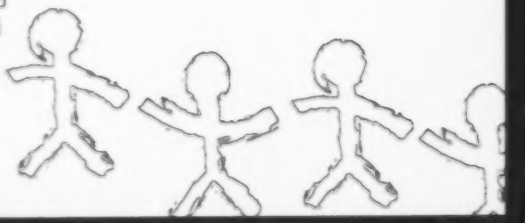
The recent Ideal Learning Environment Study conducted by Beth Schapiro and Associates, a research firm based in Atlanta, indicates that a well-designed classroom improves learning and education. And with fewer than 18 percent of teachers giving their classrooms an "A," it is estimated that more than $500 billion will be spent renovating and constructing schools in the U.S. over the next 10 years. "Learning begins with the physical environment students are in," said vice principal Valero—and he speaks from experience. With its renovation, Mueller Charter Elementary School moved up on California's report card—which measures students' yearly academic achievement on a scale from 1 to 10—from a score of 3 in 1999 to an 8 in 2000.

One of the only design regrets following the renovation was the tile flooring installed with the state funds. The surface was too hard for the teachers to stand on all-day and uncomfortable for the students to work in groups on the floor. It also didn't communicate the desired sound absorption and warmth, so school officials raised their own money and had broadloom carpet installed over the tile.
The soothing, green-and-blue carpet provided added safety for the K-6 children, and helped conceal the dirt tracked in from outside roads and trolley rails. Simple carpet inlays created a custom look, and gave the new flooring added purpose. Dark blue dots aligned at the front of the kindergarten rooms replace the masking tape Xs that once reminded children where to sit on the floor, while a wide aisle inserted through the middle of the performing arts center transformed the vacant room into a theater.

Carpet patterns aid in positioning students on the floor.

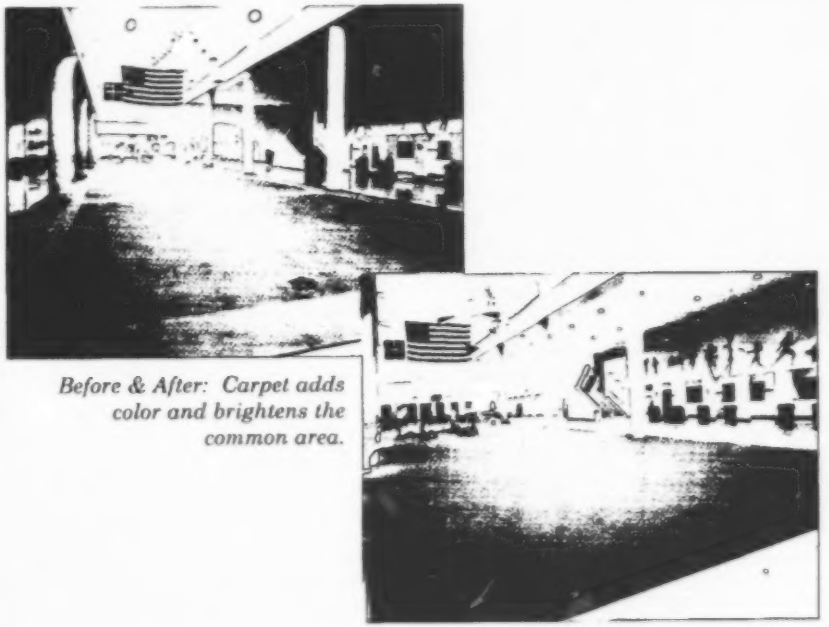
The community has embraced its new school and placed it as a centerpiece in bringing families together. A black stone privacy wall was just donated by a local business to guard the classrooms from noise, and students and their relatives even have adopted the school as a weekend destination. Most recently, the sixth grade class held a video night in the performing arts center, during which families flooded into the beanbag-filled room to watch movies together on the 200-inch projection screen. The fundraiser proved to be a rare night of family bonding, which in turn will help send the children to camp. Now, families from other classes are lining up to do the same—spend time with their children in school and create opportunities for them beyond.

The Robert L. Mueller Charter Elementary School has sent a message to kids locally that education does matter, and they have sent a message to educators nationally that good interior design leads to a positive learning environment. Renovation can save a school, renew hope and bring newfound excitement to the community. And for the families of Mueller Charter Elementary School, there is such a thing as happily ever after.



Ridgeland High School

Concerned Parent Brings Music to Students' Ears



Before & After: Carpet adds color and brightens the common area.

As students file into Robyn Wilkes' band room each day to practice their musical skills on the flutes, trumpets, drums and trombones that fill the room, they grin at the bold sign strategically placed in the entryway. "Eating is good, drinking is fine, but if you do it in here, you'll do detention time."

The warning might be provoking to some rebellious teenagers, but for the students at Ridgeland High School in Northwest, Georgia, it's a rule they're happy to abide—and enforce to new students, because they remember what the condition of their school used to be.

Like many new schools that are built in communities across the U.S. each year, Ridgeland had to determine how and where to spend its minimal budget, and did not know the right materials to select in order to extend the life of the school and limit maintenance issues.

As a result, corners were cut to save money. An inadequate roof was installed and the wrong carpet specification was chosen for high-traffic areas of the school that also was not installed with an adequate amount of adhesive or seam sealant to the carpet's edges.

Major leaking problems with the roof were noticeable just five years after the school was constructed, and for two years the school hung plastic bags from the ceiling to

catch the water and funnel it into large barrels. During this time period when the school did not have the appropriate funds available to fix the roof, the water was collecting on the carpet and began to show visible signs of the excess moisture and improper maintenance and care. The carpet became loose, buckled, bore holes, its edges frayed and was not clean. As a temporary "fix" for the problem, the school used duct tape to keep the carpet edges in place, which was not only unsightly but did not solve the original problem of the leaking roof and incorrect carpet specification and installation.

Frustrated with the issues they were experiencing with the carpet, Ridgeland determined they would replace the floor covering with vinyl composition tile, which they thought would be more cost effective and easier to maintain.

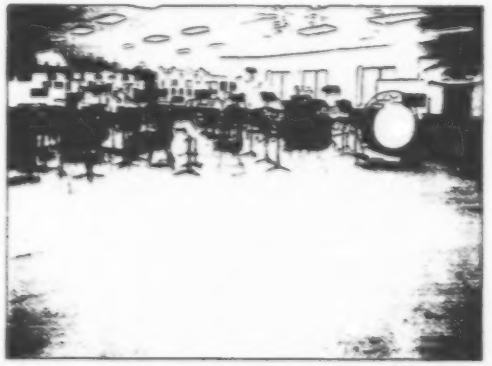
Fortunately for the school and the community, Patricia Wilson, a concerned parent and representative of the Superintendent's Parent Advisory Council, heard of the school's intentions at a monthly council meeting and offered a solution to the problems the school was experiencing.

"The school was under the impression that the carpet was the source of the problem and that tile would be the most cost effective alternative. What they didn't know is that they chose the wrong carpet specification for the school and installed it incorrectly. That, coupled with the leaking roof made for a dreadful learning environment," said Wilson. "My daughter is in the band and the school was recommending to install tile in the band room as well, which would be detrimental to the students and create an echo chamber in the room. As a parent you have to do what you can to make school a pleasurable experience for your children, so I offered the knowledge I had gained through working in the carpet industry to improve the school's learning environment."

Wilson approached Mohawk to see if they could help solve the school's floor covering problem. A representative from the Carpet and Rug Institute visited Ridgeland to help assess the situation. Since required roof repairs had already occurred, Mohawk agreed to contribute new carpet at 15 percent of the actual cost for the commons area and band room, which most needed replacement. In addition, CRI helped to identify a qualified installer who provided installation services at reduced rates.

Mohawk and the Carpet and Rug Institute (CRI) helped the school to select a blue, Wunda Weave carpet that can stand up against heavy foot traffic and demands of a 1,300-student high school, and ensured the carpet was IAQ tested and professionally installed by an installer with a Seal of Approval and according to industry standards in the Standard for Commercial Carpet Installation, CRI 104. In addition, Mohawk and CRI suggested a cleaning maintenance program, including vacuuming the carpet nightly, maintaining the school's relative humidity at or around 60 percent, regularly scheduled professional extraction cleanings and the use of a hand-held portable spot extractor for quick removal of spills.

Today when students, teachers, parents and the community enter Ridgeland High School, there are no reminders of the water-filled buckets, dampness in the air or tattered carpet on the floor. And the community has learned a valuable lesson from a concerned parent, "You get what you pay for and you keep what you take care of."



Before & After: New carpet provides some acoustical control in the band room.

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